PENINSULA CLEAN ENERGY

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# Comment on 24/7 Energy, Informational Report Item 16, July 27 Meeting

**Lane Sharman** <lane.sharman@sandiegoenergydistrict.org> Wed, Jul 26, 2023 at 1:37 PM
To: nwogberg@peninsulacleanenergy.com

Dear PCE Board Members and the Public:

Many thanks for your leadership in moving forward with 24/7 decarbonization.

Please consider the many advantages of thermal energy batteries versus electro-chemical batteries:

- Up to 1,500c degree heat storage from a variety of thermal battery manufacturers.
- Industry and buildings need heat and 50% of fossil fuels are used for producing heat.
- No Precious Metals, ordinary materials like rock, sand and salt.
- 100% recyclable.
- Durable.
- Highly efficient round trip: Electricity <> Heat <> End Use.
- Multitude of innovators: US, Europe, Israel, and Australia.
- Significantly less per KwH than Lithium Ion.

The primary downside is that a Heat Battery is only efficient if it can be used for both the generation of electricity ***and*** the production of a heating and cooling service. A steam turbine producing 8MWH of output requires 20MWH of input to the heat battery. The remaining 12MWH of energy can be used for cooling or heating. There are of course thermodynamic losses to the 20MWH of input. A steam turbine and generator can vary in output depending on steam pressure and flow.

The beauty is that a multitude of small systems can be placed throughout San Mateo county. Wherever there is commercial heating and cooling (hospitals, data centers, campuses, hotels, et al), the system can displace methane gas when used for heating and cooling. As a wholesale system in front of the meter, the thermal battery can charge rapidly during the day; discharge electricity as needed during non-solar hours; and, provide heating or cooling services as needed. It adds strong Resource Adequacy value to a CCA portfolio. It will provide significant employment for construction and operations.

A thermal battery experiences a daily loss of energy of about 2% per day. A single thermal battery in a single container can store 340MWH. It can fast charge at 70MW. It can discharge at a power level of 20MW.

Presently, scientist Dr Jose Torre-Bueno, engineer Selvam Veerappan and I are seeking funding for simulations within an R&D Study. We would like to conduct the R&D within San Mateo County and want to invite colleague Dr Mark Jacobson at Stanford to work with us.

I will call into the meeting and can make available our R&D Outline if requested.

Kindest Regards,

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TIME TO MAKE THE SWITCH